

PATENT CLAIMS

1. Data transmission device (5) with at least one data adaptation device (6) and one data distributing device (7), which device is connected between at least one process control computer (2) and field units (4) connected thereto via a bus system (3), wherein the process control computer (2) and field units (4) are parts of a process control system (1) and the data transmission device (5) is, in particular, intrinsically safe, **characterised in that** the data adaptation device (6) and the supply devices (8) assigned thereto are formed so that they are explosion-proof and each supply device (8) is connected to the data distributing devices (7) via an explosion-proof line, wherein either this or the field units (4, 17, 18) connected thereto have a barrier device (10, 11) for limiting the applied power.
2. Data transmission device according to Claim 1, **characterised in that** the data adaptation devices (6) and / or supply devices (8) can be mounted on a backwall plate (28), which has a field bus (23) for communication among the devices (6, 8) and with the process control computer (2).
3. Data transmission device according to Claim 1 or 2, **characterised in that** the data adaptation device (6) has a data matching and / or data converting circuit.
4. Data transmission device according to at least one of the preceding Claims, **characterised in that** the data adaptation devices (6) and / or supply devices (8) are encapsulated in an explosion-proof manner.
5. Data transmission device according to at least one of the preceding Claims, **characterised in that** the supply device (8) has at least one output (12) with extended safety (Ex-e).
6. Data transmission device according to at least one of the preceding Claims, **characterised in that** the data distributing device (7) and / or field unit (4, 17, 18) is formed for intrinsically safe (Ex-i) signal matching.
7. Data transmission device according to at least one of the preceding Claims, **characterised in that** the barrier device (10, 11) is integrated in the field unit (4, 17, 18) or in the data distributing device (7).
8. Data transmission device according to at least one of the preceding Claims, **characterised in that** the barrier device (10, 11) is a safety barrier with Zener diodes and / or resistors and / or fuses.
9. Data transmission device according to at least one of the preceding Claims, **characterised in that** the data distributing device (7) and field unit (4, 17, 18) are connected by means of connection lines (13)

rated as intrinsically safe (Ex-i) or having extended safety (Ex-e).

10. Data transmission device according to at least one of the preceding Claims, **characterised in that** the data distributing device (7) is a junction box (14).
11. Data transmission device according to at least one of the preceding Claims, **characterised in that** the bus system (3) between the process control computer (2) and backwall plate or bus interface module (15) on the backwall plate is a Profibus or the like.
12. Data transmission device according to at least one of the preceding Claims, **characterised in that** I/O signal matching modules (16) can be mounted on the backwall plate.
13. Data transmission device according to at least one of the preceding Claims, **characterised in that** the field units (4, 17, 18) are sensors and / or actuators.
14. Data transmission device according to at least one of the preceding Claims, **characterised in that** the process control computer (2) is connected to a server (20) via a high-speed data transmission device (19).
15. Data transmission device according to at least one of the preceding Claims, **characterised in that** the server (20) is connected to an input device (21, 22) for, at least, maintenance and modification of the process control system (1).
16. Data transmission device according to at least one of the preceding Claims, **characterised in that** the data adaptation device (6) is connected directly to the process control computer (2).